UNITED STATES DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN

678

ISSUED JUNE, 1915
CORRECTED AND REPRINTED JAN., 1923

GROWING HARD SPRING WHEAT.

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FOREWORD TO THE FARMER.

Many questions are asked each year about the growing of spring wheat. You who are farming in the Great Plains area have asked what methods or what varieties are better than those you are using. Those who are thinking of locating in this area have asked what portions are adapted to the growing of wheat and how it may best be grown.

This brief bulletin is intended to answer some of these questions about the growing of spring wheat. Another bulletin will contain brief descriptions of the best varieties and tell where they are best adapted.

As we all know, agriculture in this area is still in the early stages of its development. This means simply that the farming is done on a large scale and with few crops. Such a system nearly always develops in a newly settled area under pioneer conditions. This should not necessarily be called poor farming. The cropping methods used are, as a whole, well suited to this extensive kind of farming.

The early settler must grow the crops that are quickly and profitably produced with little equipment. He usually has rather limited means. Frequently there is but little knowledge of what cropping methods will prove best in a new part of the country.

For these reasons, among others, wheat is still grown here on the extensive scale which especially marked the early development of this area. In those districts of the Plains which have been longest settled, the type of farming is slowly changing to a more diversified system.

NOTE.—This bulletin discusses the topographic, soil, and climatic features of the northern Great Plains, with special reference to the production of hard spring wheat in that area. Cultural methods for growing the crop are given.

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Much of the area under discussion has been converted from cattle range by the present generation of farmers. Its western portion is even now the frontier—the scene of ceaseless and often severe struggle between the settler and the forces of nature. Added to these handicaps often are those of scattered settlement, the lack of school and social facilities, and the distance from market.

This paper is prepared especially for the new settler, not yet acquainted with the soil and climate or the general methods of wheat production in his new home.

OUR LARGEST SPRING-WHEAT FIELD.

Out in the northern part of the Great Plains area lies Uncle Sam's great field of spring wheat. This field contained in 1919 nearly 21 million acres of hard spring wheat, of which more than 16 million

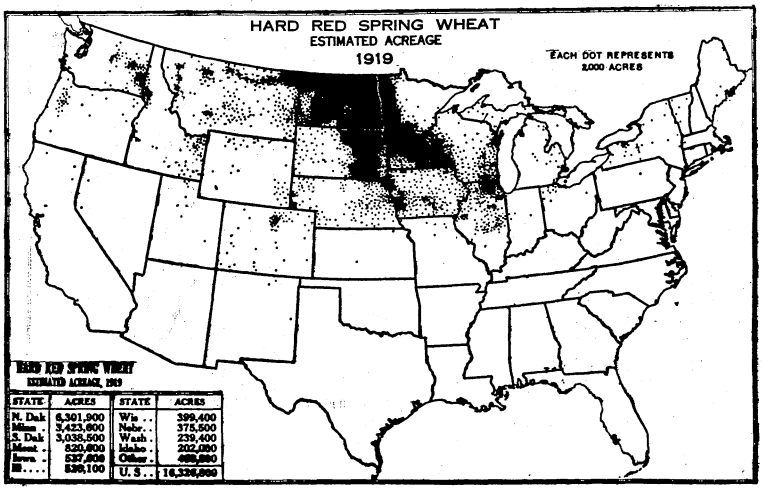

FIG. 1.—Outline map of the United States, showing the distribution of hard red spring wheat in 1919. North Dakota, Minnesota, and South Dakota lead in its production.

acres were in the Dakotas and Minnesota. More than one-fourth of the total wheat acreage of the United States that year was of this class. The acreage of all wheat in 1919 was larger than usual because of a general desire to add to the food supply and take advantage of the high prices then prevailing. The hard spring wheat acreage was extended to the southward and eastward, being far greater than normal in Nebraska, Iowa, Wisconsin, and Illinois. More spring wheat than usual was also sown in Michigan, Ohio, New York, and in the New England States. Since 1919 the acreage of spring wheat in all these States has been greatly reduced.

As most of us know, there are two distinct kinds of hard spring wheat—common (hard red spring) wheat and durum (macaroni) wheat. Of the nearly 21 million acres of hard spring wheat about three-fourths are hard red spring wheat (fig. 1) and one-fourth durum wheat (fig. 2).

South of the big field of hard spring wheat is an equally large area of hard winter wheat, with Kansas as its center. The two fields naturally overlap to some extent. Wherever winter wheat can be safely grown it is more satisfactory and more profitable than spring wheat.

The boundaries of the winter-wheat field are being slowly extended to the north and west. The expanding of the spring-wheat field is mostly to the westward, as the cattle range gives way before the pioneer farmer.

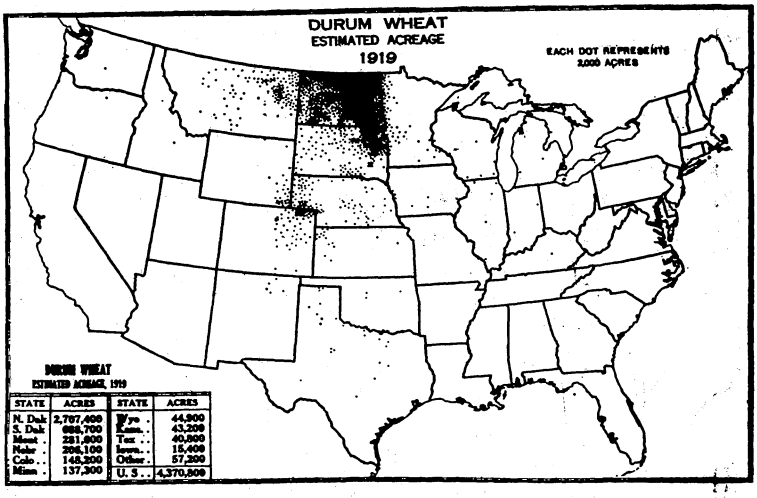

FIG. 2.—Outline map of the United States, showing the distribution of durum wheat in 1919. North Dakota, South Dakota, and Montana lead in its production.

WHAT IS THE NORTHERN GREAT PLAINS AREA?

SIZE.

Most of us think of the Great Plains area, and rightly, too, as the nearly level and rather dry area lying between the prairies of the Mississippi Valley and the Rocky Mountains. No hard and fast boundaries can be given to it in a bulletin of this kind.

We are here concerned only with the northern section of it. Roughly speaking, this is over 600 miles long, north and south, from Canada to central Kansas. From east to west it is a steady upslope from the line of 30-inch rainfall to the Rockies, with an average width of about 450 miles (fig. 3).

From the map we see that it includes the Dakotas and eastern Montana, the western portions of Nebraska and Kansas, and the eastern parts of Wyoming and Colorado.

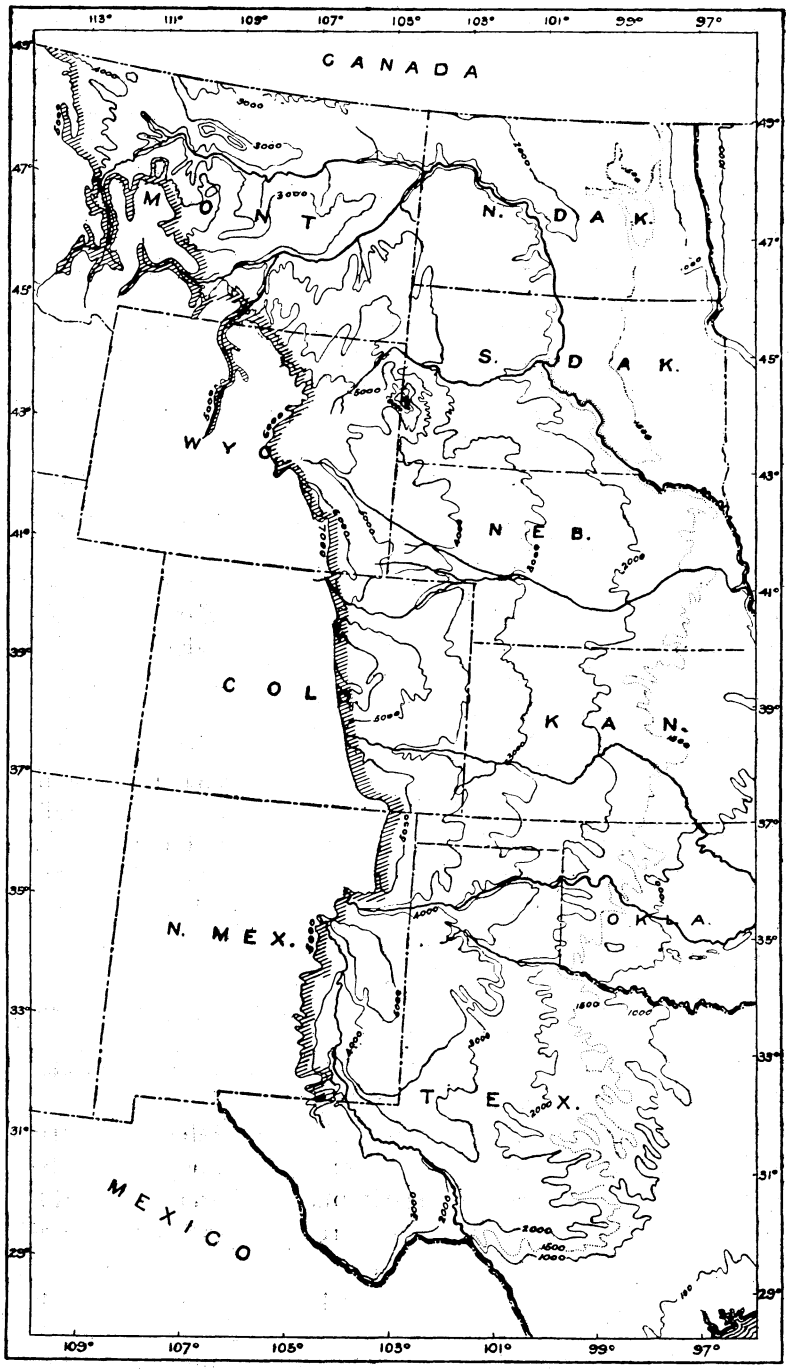

FIG. 3.—Map of the Great Plains area, showing the elevation above sea level, in feet, by means of lines following the contours at 1,000, 1,500, 2,000, 3,000, 4,000, 5,000, and 6,000 feet.

In general, this section and the similar section stretching southward are spoken of as the dry plains or the semiarid plains. In the same way, the farming methods in use here are popularly called dry farming, to distinguish them from the methods used in irrigation farming in the West or in humid farming farther east.

SURFACE.

Let us look at the map (fig. 3), which shows the height in feet above sea level by means of lines, each following a different level. These are called contour lines. The larger rivers also are shown, in order to give a better idea of the slope and drainage. We note that the highest elevation (6,000 feet and over) is reached in east-central Colorado. From here the surface slopes north, east, and south, though most rapidly to the east.

The northern border of the area varies in elevation from 1,000 to 3,000 feet, while the southern edge is higher, ranging from 1,500 to 6,000 feet. The eastern boundary varies in elevation from about 1,000 feet in the Dakotas to about 1,500 feet in Kansas. Along with these wide differences in elevation are found differences in annual rainfall, length of growing season, etc., which make them of much importance to the farmer.

SOIL.

Many things besides soil are important to wheat growing in the Great Plains. Such influences as rainfall, temperature, wind, and tillage methods usually are the things of greatest importance in this section. However, the kind of soil and its fertility may govern the successful growing of wheat in some places. A few definite statements about the soils of the Great Plains can be made:

(1) Most of the soils in this section contain plenty of the more important plant foods, such as nitrogen, potash, phosphorus, and lime.

(2) Humus, or decaying vegetable matter, is very necessary to good crops.

(3) Humus gives a dark color to soils. The relative quantity of humus present can be determined, therefore, by the color of the soil in this section. Valley soils are nearly black; upland clays and loams are brown, red, or yellow; sandy soils are gray; and sands are nearly white.

(4) Most of the soils in the eastern part of this northern plains section originally contained large quantities of humus. This is a result of the heavy growth of grass and other plants and their slow decay in a favorable climate.

(5) In the drier western portions of this section enough humus is not present in the soils. The size and abundance of the native vegetation decrease westward step by step as the rainfall gradually decreases.

(6) A firm seed bed and a fairly compact subsoil are desirable. Therefore, the heavier soils are best suited to the growing of wheat.

(7) The river-valley loams, clay loams, and sandy loams of the district east of the Missouri River are especially well suited to the growing of wheat.

(8) Most of the soils in this district have sufficient slope to cause good surface drainage. Where they are nearly level they should be provided with either surface drainage or subsoil drainage. If not well drained, the heavier clay soils become too tight, are hard to work, and do not give good yields.

(9) The silt loams and sandy loams west of the Missouri River are also well suited to the growing of wheat. These soils are lighter than those of the valleys in the eastern part. However, they are very fertile and productive, though often lacking in humus.

(10) Humus can be added by plowing under green-manure crops, such as rye, peas, or sweet clover, or by adding well-rotted stable manure. These will rot fairly well and benefit the crop.

(11) Coarse or trashy material, such as coarse manure or straw, should not be turned under in a dry climate. It will not rot readily, and, in fact, may loosen and dry out the soil too much and decrease the yields.

(12) Light soils, such as sands and sandy loams, do not hold water well. Green-manure crops or well-rotted stable manure plowed in make light soils heavier and also absorb and hold water.

(13) While sandy soils hold less moisture than heavy soils, crop plants usually can use more of the moisture stored in sandy soils than in heavier soils.

(14) Sandy soils require careful tillage to prevent their blowing. Special care is needed on the looser sands. Leaving the surface rough and working in organic matter will tend to prevent blowing. Deeper sands are best left in pasture, as the wind may cause much damage by blow-outs as soon as the vegetative covering is broken.

(15) The soils of this area sometimes have unproductive spots, often due to the presence of large quantities of injurious alkali. This is a condition of the soil rather than a kind of soil. These spots, which are commonly called "gumbo," often cause much trouble.

(16) Barnyard manure applied year after year upon these spots will help to correct this condition. Means for draining them in wet years are also helpful. After they have once been subdued they are quite productive.

CLIMATE.

The climate of the northern Great Plains is marked by a low and variable annual rainfall, long cold winters, a short growing season, and rather strong wind movement.

Most of the annual moisture supply in this section comes during the four summer months of May, June, July, and August. June usually is the wettest of these. July and August, the months of harvest, however, are fairly wet.

Crop production throughout the entire section is governed largely by the annual rainfall.

The annual rainfall, as shown in figure 4, decreases gradually across the Plains, from 30 inches in the eastern part to 10 inches or less in the extreme western part. The heavy lines on the map show the annual rainfall in inches. The strip between any two lines receives an intermediate quantity of rain.

Much of the moisture not used by the previous crop, and also of that which falls during the autumn and early winter, is saved through the long, cold winters, during which the soil remains frozen. This, with the scanty moisture from the winter snow, is generally sufficient to start crop growth in the spring.

The later growth of the crop depends largely upon rains which occur during the growing season. The timeliness of this rainfall and the absence of hot winds and hail often govern the production of a successful crop.

The years of greatest rainfall usually have low summer temperatures and low evaporation.

Hot winds occasionally occur and cause a premature ripening and sometimes a complete drying up of the crop.

The length of the growing season is limited chiefly by the occurrence of early autumn frosts. Late spring frosts do little damage to the young wheat plants. Early fall frosts, occurring before the wheat is mature, occasionally cause a decrease in the yield and quality of the grain.

The frost-free period varies in length with the elevation above sea level, lasting for 130 days or more in the lower to 90 days in the higher altitudes.

ROTATIONS FOR SPRING WHEAT.

Rotation means simply the growing of two or more different crops on the same field in successive years instead of growing the same crop year after year. Wheat followed by corn or oats would be a rotation. Wheat followed by fallow also may be called a rotation.

One crop grown continuously, as wheat followed by wheat, is called continuous cropping or single cropping. Much of the farm land in

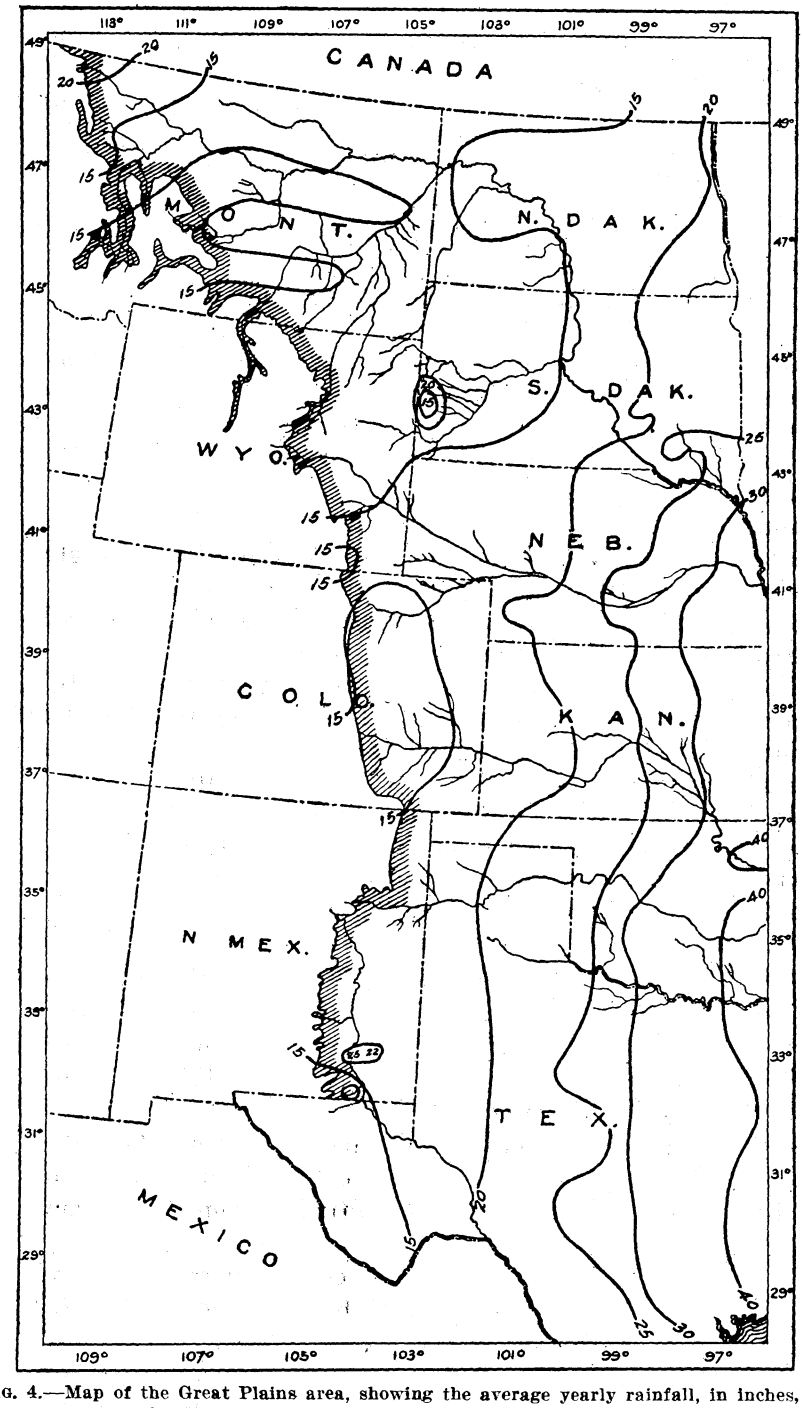

FIG. 4.—Map of the Great Plains area, showing the average yearly rainfall, in inches, by means of lines running through places having about the same rainfall.

the northern Great Plains area has been continuously cropped to wheat.

Farm crops become more diversified, and systems of crop rotation are started gradually as communities become older and the farms better equipped. The wheat acreage in such a community may be reduced; and yet the total production may remain the same or actually increase because of better yields from rotations than from continuous cropping. Even in the newer communities there are many advantages to be gained from having good rotation systems.

REASONS FOR ROTATING CROPS.

There are many reasons for rotating crops. Some are more important in one section, some in another. Among them may be mentioned the following:

(1) Rotation increases the total crop yield.

(2) It distributes the risk of crop failure, since conditions injurious to one crop frequently do not affect other crops.

(3) It gives a better distribution of farm labor throughout the year.

(4) It allows the keeping of more live stock, which favors a better use of farm crops and furnishes farm manure.

(5) It allows the use of green-manure crops and the satisfactory application of farm manures, thus maintaining the fertility of the soil.

(6) It insures a better control of weeds, injurious insects, and fungous diseases of crops.

(7) It uses soil moisture more completely, as different crops use water differently.

EXAMPLES OF ROTATIONS.

Many problems must be solved in planning rotations for the northern Plains in which spring wheat shall be the money crop. Combining grain growing with stock raising is the best possible basis for profitable rotations and high wheat yields. It is now freely admitted that growing wheat continuously on the same land is not profitable in the long run.

In the eastern and more humid part of the northern Plains the increase of fungous diseases and weed pests is making continuous wheat cropping unprofitable. A cultivated crop is necessary in the rotation to hold the weeds in check.

For stock feeding, alfalfa and red clover can be grown quite generally in this section. Here such a rotation as (1) wheat, (2) oats (or barley), (3) clover, and (4) corn can be used with profit on combined grain and stock farms. Wheat and barley are hard to separate in mixtures, and where they volunteer freely one should not follow the other in rotation.

In the western districts of the northern Plains, where the saving of moisture is important, the cultivated crop is still more needed.

In the drier parts of western South Dakota the agricultural experiment station of that State recommends rotations containing small grains, Manchu kaoliang, and alfalfa. The kaoliang is an early grain sorghum, taking the place of corn, which is less profitable there. About half the alfalfa should be drilled in wide-spaced rows and cultivated for seed.

Farther north, in North Dakota and Montana, corn may be grown for fodder or silage, while the cooler nights prevent the use of kaoliang. A simple rotation is (1) corn, (2) wheat, (3) oats. Where necessary, potatoes may be the cultivated crop.

Land which has borne a cultivated crop, such as corn, kaoliang, or potatoes, can be prepared for small grain much more cheaply than can stubble land.

In the driest parts it may be necessary to alternate wheat and summer fallow or to fallow the land at least every third season. Green-manure crops, such as winter rye or sweet clover, may be substituted for the fallow. They should be plowed under early in the season and the surface cultivated afterwards to hasten rotting and save moisture.

SUMMER FALLOW IN THE ROTATION.

Summer fallowing land for wheat every second or third year is sometimes practiced in the drier portions of the Great Plains area, especially in the winter-wheat section. Summer fallow in the rotation system reduces the danger of complete failure by drought and in some cases has increased the average annual yield.

In fallowing every second year the expense of keeping a fallow clean from the fall of one year until the spring of the second year after is usually greater than any profit from increased yield. Since only one crop is grown in two years, the average yield for two years is only one-half the actual yield of the one year.

A fallow maintained through the 18-month period mentioned requires one and sometimes two plowings and several workings with the disk and harrow to keep the land free from weeds. To save one spring working, spring plowing usually is preferable to fall plowing for fallow.

In the eastern and more humid parts of the spring-wheat section a profitable crop can be grown each year at the cost of one plowing, a disking, and a harrowing.

One year of fallow in a rotation of three or more years usually will be more profitable than alternate cropping and fallowing.

Corn or other cultivated crops can be grown in place of the fallow where it is necessary to save moisture every other year for the

wheat crop. The following wheat crop will be nearly as large after a cultivated crop as after a fallow.

The expense of growing this cultivated crop will be little or no greater than that required to keep the fallow clean. If the resulting crop matures, it will be largely profit. If not, there will be little loss.

Fallowing should not be done generally where a cultivated crop can be grown and used with profit. An occasional fallowing, however, will greatly reduce the growth of weeds and help to improve the physical and chemical condition of the soil.

PREPARING THE SEED BED.

Plowing in some form is the necessary first operation upon which agriculture has depended from the beginning. To the new settler, whose land is still in native grass, success or failure frequently depends on how he prepares his land for his first crop.

Remember that sod land in the semiarid regions should be broken deeper than that in the more humid districts. The early settlers of the Red River Valley and other fairly humid districts of the Plains found it best to break the sod land 3 inches deep in May or June and backset 5 or 6 inches deep in September or October.

The pioneers who settled later in the drier portions of the Plains found the land too dry in the fall to backset the sod and turn up the extra 2 or 3 inches of soil. Their experience shows that the sod should be broken 5 or 6 inches in depth when the grass is growing most rapidly, usually in May or June.

The sod should be turned evenly, bottom side up. It requires a sharp plow and skillful handling to strike a straight and uniform furrow.

It is best not to crop this land to wheat or any other small grain the first year. If not sown to flax, it should be worked down with a disk and harrow after the heavier rains of the summer and fall. Disking and harrowing again in the spring will make a well-prepared seed bed for wheat.

A firm seed bed with about 3 inches of fairly fine moist mulch is the best preparation for wheat.

When spring wheat is to follow a crop of wheat, oats, or barley, prepare the seed bed in the fall. Plow as quickly as possible after the former crop has been removed from the land. This holds the moisture remaining in the subsoil, stores the fall rains, and liberates nitrogen. This is of most importance in the eastern and more humid portion of the northern Plains area.

Farther west, in the drier districts, little or no moisture remains in the soil after a crop is mature. Leaving the stubble standing to catch

snow and then plowing in the spring often gives the best results under these conditions.

Plow early in the spring when fall plowing is not possible or where spring plowing is best.

Plowing from 5 to 8 inches in depth has been more profitable than shallower or deeper plowing.

Work down the land with a disk or harrow immediately after plowing. This prevents a rapid drying out of the newly turned soil and saves the moisture remaining below the furrow slice.

Light soils which are easily blown should not be worked too much. Furrowing them with a lister instead of plowing will largely prevent the drifting of the soil during the winter. The furrows should be leveled in the spring by disking and harrowing immediately before drilling the wheat.

Disk and harrow corn or potato ground thoroughly in the spring to prepare it for wheat.

Pack light soils, or soils loosened by plowing in trash or strawy manure, with the disk or subsurface packer. Weight the disk harrow and set the disks straight.

WHAT IS GOOD SEED?

CHANGING SEED.

Use home-grown wheat for seed wherever possible. The common belief that seed "runs out" after a few years is not founded on fact.

The quality of seed often varies with the nature of the season. Seed of an adapted crop grown continuously in one section should not only maintain its quality year by year, but should really improve in adaptation to local conditions.

When it is necessary to get new seed it should be obtained in the community if possible. Change seed only for the purpose of getting a better variety of known value.

CLEAN SEED.

Clean and grade the seed by the use of the fanning mill, thus removing all weed seeds, trash, and broken or shrunken grains before planting. In this way the yield and quality of the crop can better be maintained.

TREATMENT FOR SMUT.

Treat the wheat seed with formalin to destroy bunt or stinking smut. The method is described in Farmers' Bulletin 939, entitled "Cereal Smuts and the Disinfection of Seed Grain." If this treatment is properly applied it will effectually prevent this smut of wheat.

After the seed is treated it will become infected again if placed in smutty bags, bins, or drills. These should all be treated unless they are known to be free from smut spores.

Sow the seed within a few days after treating, as the germinating power sometimes weakens after treatment.

Loose smut, which is less common than bunt, is more difficult to control. However, it can be destroyed by the hot-water treatment, which is described also in Farmers' Bulletin 939.

The spores of the loose smut infect the young seed at the time of flowering and at no other time. Therefore, if the seed used is from a field in which and near which no smutted heads grew it will be free from this smut.

GERMINATION TESTS.

Sound, mature wheat usually germinates well. If the seed is old, shrunken, or thought to have been weakened in any way, a germination test should be made. This can easily be done by counting out two or three lots of 100 kernels each and placing them between moist blotters or in sand. Keep them moist for several days, at about the temperature at which bread rises best. Only those seeds which produce strong sprouts should be counted.

Germination will always be better in blotters or sand than in the soil under field conditions. Poor seed should not be sown. Seed found to be somewhat weak in vitality should be sown at a heavier rate than that ordinarily used.

SOWING THE SEED.

METHOD OF SOWING.

A modern grain drill should be used for sowing wheat. The shoe drill, the single-disk drill, and the double-disk drill are about equally well suited for seeding in a well-prepared soil. In the drier soils the single-disk drill requires less power to place the seed at a depth where moisture is present than do the other drills.

All drills should be provided with covering chains or press wheels to insure the covering of the seed. The press wheels firm the soil closely about the seed and are most valuable in sowing spring wheat on the lighter soils. The drill rows should be from 6 to 8 inches apart.

TIME OF SOWING.

Spring wheat should be sown early. On fall plowing it is usually safe to sow the wheat as soon as the land can be put in good tilth after the frost is out of it.

On very weedy land postpone the seeding and kill the weeds. When the weed seeds have germinated, destroy the young weeds with the disk and harrow. The delay in seeding will be largely equalized by the more rapid growth of the wheat on land so worked. The soil is dried by the working and becomes warm more rapidly.

The best time for sowing wheat can not be given exactly for all of the section being considered. In general, sow early.

Seeding may be continued with but little risk up to the second week in May when necessary. A decreased yield will usually result from the later sowings.

RATE OF SOWING.

The quantity of seed that should be sown to the acre in the northern Great Plains area will vary with the amount of moisture present in the soil, the size of the kernel of the variety used, the condition of the seed bed, and the date of seeding.

Under ordinary conditions 4 pecks to the acre are best. In the eastern part, where the annual rainfall is high and the soil heavy, rich, warm, and well drained, 5 or 6 pecks will give better results.

In the drier and lighter soils of the western portion 3 pecks to the acre are sufficient.

Durum wheat has larger kernels and should be sown, as a rule, at a rate 1 peck heavier than common wheat under the same conditions.

On a poorly prepared seed bed or when the seeding is late, increase the rate of seeding 1 or 2 pecks over the ordinary rate.

DEPTH OF SOWING.

Sow spring wheat about 2 or 3 inches deep. Deeper than 3 inches is advised only in loose, dry soils, where it is necessary to get the seed down to moist soil. On heavy soils, where a good supply of moisture is present, 1 to 2 inches is deep enough.

CULTIVATION OF THE GROWING CROP.

A light cultivation at the time the young plants are from 4 to 6 inches high is sometimes worth while. The spring-tooth weeder is best for breaking the crust and killing weeds and is less injurious to the young plants than the spike-tooth harrow.

On heavy soils cultivate the crop in dry seasons. Do not cultivate on light soils and in years when there is enough rain for the growing wheat.

HARVESTING THE CROP.

CUTTING.

Wheat that is allowed to become mature before cutting makes the best flour. Where the acreage is small, cutting should be delayed until the kernels are well hardened.

Where the acreage to be harvested is large, cutting may begin before the grains are entirely hardened but after the straw has lost nearly all of its green color. If the crop becomes overripe, a loss in quantity from shelling may result.

Durum wheat usually looks riper than it really is. Even when fully ripe it can be left standing longer than common wheat, as it does not shatter.

The greater part of the spring-wheat crop of the northern Great Plains area is cut with a binder. The condition of the bundles and their convenient handling depend largely on the adjustments of the binder.

The header is used to some extent in western Nebraska and quite commonly in the James River valley of South Dakota. It is of most value where little or no rainfall occurs during the harvest season.

SHOCKING.

Wheat cut with a binder should be shocked in the field immediately. The shocks should be placed in rows, so that they can be hauled later with the greatest convenience. The quality of the thrashed grain depends greatly on the care used in shocking.

The shock should be started by taking a bundle in each hand and, with a single swing, jamming the butts firmly into the stubble, side by side, a few inches apart, the heads leaning against each other to prevent falling. The next two are placed against the edges of the first pair. From 6 to 8 or 10 more bundles can then be placed firmly about these until a round shock of the proper size is formed.

In the eastern, more humid and less windy districts it is well to cap the shocks to protect them from rain and birds. Make the cap by breaking down the straw at the band toward both the heads and the butts of two good bundles. These should be placed firmly on top of the standing bundles.

STACKING.

Only about one-fourth of the wheat in this hard spring-wheat section is stacked under present conditions. Thrashing directly from the shock is more commonly practiced, as the total cost usually is somewhat less.

Stacking gives greater protection, however, results in a better quality of wheat, and allows more economical thrashing. Early fall plowing is made possible by the removal of the shocks from the fields. This is usually very desirable and often will pay for the extra expense of stacking.

Well-stacked grain can be allowed to remain for weeks or months before thrashing, without damage.

Stacking should be done as soon as the grain is well cured in the shock, usually after 10 to 20 days. Four stacks are commonly built, in pairs 6 feet apart, to form a setting. The stacks are round and usually 10 feet in diameter at the base.

First, build a large, round shock or stook, about 8 feet in diameter; then place two layers of bundles, one directly on top of the other,

with heads resting against the shock, and the butts forming the 10-foot circular base. The next row is laid with the butts extending just past the bands of the outer row, like shingles, and so on, overlapping the rows a little more as the center is approached; then begin again at the outside.

Shocked bundles have a slanting butt. Lay the successive outer layers with the long edge of the butt on top and projecting beyond the layer beneath. Increase the diameter in this way until a height of 7 or 8 feet is reached. This forms the bulge.

Always keep the middle high and firmly tramped. Do not tramp the outer layer at all. If possible, have loads pitched from different sides of the stack to obtain more even tramping.

From the bulge the stack should taper slowly to a point. This is done by laying the bundles now with the short side of the slanting butt uppermost, gradually decreasing the diameter.

Keep the middle high and well tramped—so high that the beginner will fear that the outer layers will slide off. Sometimes they will, but that is better than having rain water soak in.

At the peak, which should be 20 to 24 feet from the ground, the bundles will overlap, and the cap sheaf should be securely fastened by driving a 6-foot stake into the top of the stack. Stacks well built should shed water perfectly.

THRASHING.

When thrashing can be done early, the most economical method is to thrash directly from the shock. Thrash when the grain is dry, either before or after it has gone through the sweat. If the grain is too dry, it will crack badly in thrashing.

Wheat thrashed before sweating in the shock will go through the sweat in the bins, giving the grain a darker and richer color. Grain that is thrashed when damp will sweat too much and become hot and bin burnt. When grain is stacked it should be allowed to go through the sweat before thrashing.

Community thrashing is desirable where the farms are not large. The individual farmer will get his thrashing done more rapidly and economically where a group of farmers can own and operate a thrashing outfit together.

See that the separator is well cleaned before the thrashing is started, in order to prevent the mixture of grain and the scattering of weed seed from the neighboring farms.

Watch carefully the working of the machine to see that the grain is entirely removed from the straw and that the chaff is blown out.

Stack the straw, use it as feed or bedding for live stock, and so convert it into manure.

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1923